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Using iPads in vocabulary instruction for elementary English language learners

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USING IPADS IN VOCABULARY INSTRUCTION FOR ELEMENTARY ENGLISH LANGUAGE LEARNERS

by

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Dedications

I would like to dedicate this manuscript to my loving mother, grandparents, and boyfriend. Thank you for your unwavering support and encouragement.

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Abstract

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The purpose of this study was to examine if English language learners (ELLs) would increase their vocabulary scores in the areas of word recognition, word meaning, and word application when iPads were used during vocabulary instruction. Five at risk third graders enrolled in the school's ELL program participated in the study. All students demonstrated weak English vocabulary skills in the tests during the baseline. During the intervention, 36 vocabulary words selected from the 3rd grade's Dolch word list were taught using flashcards and practiced using the iPad application: *Learning Touch Sight Words Pro*. All students were assessed weekly and their vocabulary scores increased in the areas of word recognition, word meaning, and word application during the intervention. Using the iPad seems to provide a successful avenue for ELLs in learning English vocabulary words.

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Introduction

Statement of the Problem

According to the Homeland Security Yearbook of Immigration Statistics (2013), the number of people immigrating to United States has steadily increased over the past decade. In 2013, around 990,000 immigrants came to the United States. Of these, 53,000 settled in New Jersey; the fifth highest-ranking state for immigration (Yearbook of Immigration and Statistics, 2013). As these numbers steadily increase from year to year, so do the number of students entering the public schools that require English language and bilingual programs. Currently, students grades K-12 requiring such programs are referred to as English language learners (ELL). These students account for 9.1% of all school age children grades K-12. In New Jersey, about 4% of all students enrolled in public schools are ELLs (nces.ed.gov/programs/digest/d13/tables/dt13_204.20.asp).

One major concern for ELLs is language development. Often, these students are placed in a school environment that is unfamiliar with varied levels of English language programs provided. In addition, a lack of prior knowledge of content being taught and a clear understanding of the classroom expectations significantly impacts these students' language development (Fehr, Davison, Graves, Sales, Seipel & Sekhran-Sharma, 2012).

Verbal communication and listening comprehension skills are both important components that ELLs must master before they can learn to read English words within the context of printed text. In order to increase these skills, students must develop their vocabulary knowledge. Without a strong vocabulary background, students are unable to successfully comprehend what they are listening to and/or reading (Fehr, Davison,

Graves, Sales, Seipel & Sekhran-Sharma, 2012). Skilled and experienced readers have learned the strategy of using context clues to determine the meaning of unfamiliar vocabulary within text, while ELLs most often struggle in acquiring sufficient vocabulary to communicate with peers and teachers in school. Also, these students have delayed vocabulary development and experience difficulty in comprehending grade level text and becoming successful readers. In addition, they will be at risk of being diagnosed as learning disabled; even though their limitation is due to insufficient English language. It is critical to academic success that ELLs not only increase their vocabulary knowledge but also catch up with their English speaking peers in language learning (August, Carlo, Dressler, & Snow, 2005).

According to Beck, McKeowen, and Kucan (2002, cited by Sibold, 2011), vocabulary words are arranged in three categories, i.e tiers. Tier one contains basic or common high frequency words. Tier two includes general academic words in cross-curricular texts with multiple meanings. Tier three consists of words that are not part of daily use but are content specific. In order to increase these students' vocabulary development, educators must first focus on Tier one words during lesson instruction. Tier two words are comparatively easy to master within context, once students have a comprehensive Tier one vocabulary. Tier three words, due to their technical nature and lack of appearance in everyday context, must be explicitly taught within the context they appear (Beck, McKeowen & Kuncan, 2002). Because the fact that acquiring a second language is a challenge, using realia; real objects or items to visually make abstract vocabulary more concrete is a successful teaching strategy (Sibold, 2011). When students

are able to see a visual representation of the word, it is more likely that they will make a lasting connection between the word and its physical item (Sibold, 2011).

Cognates are words in different languages that come from the same root and sound similar. Cognate comparison activities have been found to be successful in supporting ELLs as they acquire English vocabulary (Montelongo, Hernandez, Herter, & Cuello, 2011). This strategy is especially prevalent for Spanish speaking students, because approximately 40% of all English words have Spanish cognates (http://www.colorin colorado.org, 2007). There are more than 20,000 English-Spanish cognates that appear in listening, speaking, reading, and writing vocabulary words. Teachers should encourage students to make connections between vocabulary in their native language and that of the English language as a way to bridge the gap between the two (Montelongo, Hernandez, Herter, & Cuello, 2011).

Students with limited vocabulary knowledge ultimately have a larger disadvantage when learning new materials and words (Newton, Padak, & Rasinski, 2008). Introducing new vocabulary is important to language development and students must have multiple exposures and experiences in learning new vocabulary. These multiple encounters must occur in a variety of contexts that require students to complete a variety of tasks (Carlo, August, McLaughlin, Snow, Dressler, Lippman, Lively, & White, 2004). For example, students should be exposed to a variation of new vocabulary words used within the appropriate context. Using audio books to listen to the words read aloud while simultaneously viewing the word in context will support these students as they strengthen their understanding of the meaning of new words and increase reading fluency and prosody (http://www.colorin colorado.org, 2007). Cloze sentences are also an

effective way to reinforce new vocabulary while asking ELLs to select the word that appropriately fits within the context of a sentence (August, Carlo, Dressler, & Snow, 2005).

When reading, students are required to use prior personal experiences and background information to understand and make connections to what they are reading. In many cases, ELLs do not possess the background knowledge needed to understand new vocabulary. Educators must present helpful contextual and background information to support the students before they are introduced to new topics and/or vocabulary, which could help students make a connection between their familiar background and the new learning, so that their comprehension could be increased (Dukes, 2005).

In addition, visual strategies such as picture cues, bilingual picture books, and graphic organizers are effective techniques in teaching vocabulary to ELLs (Pang, 2013). Graphic organizers can be used to visually represent and organize their ideas in a way to help students make sense of what they are reading or listening to. The format of the graphic organizer may vary, but the purpose stays consistent (Pang, 2013).

Technology-based vocabulary instruction has been proven to be beneficial for students (Wheatley, Muller, & Miller, 1993). Although research regarding technology-based vocabulary instruction for ELLs is limited, a number of technology-based strategies have been identified to improve vocabulary instruction. For example, a computer can be used through verbal/auditory activities (e.g. Wheatley, Muller, & Miller, 1993). When students speak into the computer's microphone, their pronunciation of the English word is compared to that of a native English speaker. A visual representation of the word is often presented to link this word to a physical object or action. This strategy

reinforces the correct pronunciation of English vocabulary and provides a concrete example (Dukes, 2005). Verbal/auditory instruction is also used to provide students a connection between the words and their knowledge in their native language. Another example of technology- based vocabulary instruction is the use of video segments to promote background knowledge regarding new vocabulary as a way to foster increased comprehension of newly introduced words (Dukes, 2005). According to Lin (2010), computer-assisted language learning (CALL) can result in incidental acquisition of vocabulary including nouns, adjectives, and verbs; consequently increasing comprehension. In addition, online graphic organizers such as the Inspiration© software allow ELLs to exhibit understanding of new vocabulary using pictures as well as words with support of a pre-structured format. For example, pictorial activities allow students to match images to a corresponding written word while using audio and visual representations to convey the meaning of specific vocabulary (Dukes, 2005). When participating in technology-based vocabulary activities, students can answer their questions immediately while reducing waiting time. Questions are answered anonymously, which eliminates the risk of students being embarrassed in front of their peers (Wheatley, Muller, & Miller, 1993). Another benefit of technology-based vocabulary instruction is that it can take place virtually anywhere. Whether a student is at a computer in his classroom or using a mobile device at home, learning potential is not interrupted**.** An iPad is one example of mobile devices, popularly used. It is easy to carry, and its feature of touch screen allows learners to complete activities on the go. Due to the fact that iPads are commonly used for a variety of purposes, using such devices for educational purposes does not cause students to feel different and/or self-conscious.

Recently, iPads have been used in classrooms to support literacy instruction, to enhance student learning and promote student engagement in cross-curricular settings (e.g. Hutchinson, Beschorner & Schmidt-Crawford, 2012). It seems that there is potential for the use of this mobile technology in literacy instruction in classrooms. If implemented into technology-based literacy activities, it is possible that the iPad could enhance instruction as well as student's academic success.

Significance of the Study

A variety of different instructional methods have been implemented into classrooms across the country to support ELLs in vocabulary development. These include pictorial vocabulary activities, fill- in- the blank tasks, matching exercises, cloze passages and cognate similarity activities (http://www.colorin colorado.org, 2007). Recently, technology has been used in vocabulary instruction for students including verbal/auditory activities (Wheatley, Muller, & Miller, 1993), computer software **(**Lin, 2010**)** and internet based graphic organizers (Dukes, 2005). To date, a mobile device, such as an iPad is popularly used in school and at home, while limited research is found to examine the effect of such technology in vocabulary instruction for students, especially ELLs. The present study is designed to use iPads in elementary vocabulary instruction for these students. It attempts to increase their vocabulary knowledge in word recognition, meaning and application.

Purposes of the Study

The purposes of this study are to: (a) provide technology-based instruction with an iPad to enhance vocabulary teaching; (b) evaluate ELL student learning outcomes when an iPad is applied during vocabulary instruction.

Research Questions

1. Will ELL students' scores of vocabulary recognition increase when iPads are applied during vocabulary instruction?
2. Will ELL students' scores of word meaning increase when iPads are applied during vocabulary instruction?
3. Will ELL students' scores of word application increase when iPads are applied during vocabulary instruction?

Chapter 2

Literature Review

Vocabulary acquisition is a critical component in determining academic success in school aged children (Foil & Alber, 2002). When learning new vocabulary, ELLs are facing an increased challenge due to the fact that the vocabulary being learned is not in their native language. They need teacher support to practice various strategies in their vocabulary learning. They also need to acquire new vocabulary at a rate that will allow them to stay competitive with English speaking peers (August, Carlo, Dressler, & Snow, 2005).

There are a number of instructional strategies to provide vocabulary instruction to ELLs. This chapter presents a review of research on three specific strategies: teaching vocabulary within the text**,** visual/multisensory approach, and the use of cognates. In addition, technology-based instruction will be reviewed in the areas of using verbal/auditory approaches, specific software and online graphic organizers.

Teaching Vocabulary Within the Text Context

This approach refers to teaching students to use the authentic context in which the vocabulary appears to help figure out the meaning of an unknown word. It has been provided for teaching vocabulary to ELLs since the 1980's as an effective strategy (Carlo, August, McLaughlin, Snow, Dressler, Lippman, Lively, & White, 2004; Lesaux, Kieffer Faller & Kelley, 2010). For example, in the study of Carlo, et, al, (2004), 142 ELLs and 112 English only (EO) 5th graders were instructed using word learning strategies including teaching vocabulary within text context (e.g. cloze passage tasks) and inferring word meanings from context. Students were randomly assigned to either the

treatment or control group. They were tested in the fall as well as the spring to assess skills learned within the curriculum that represented word knowledge, inferring word meanings from context, and reading comprehension. Instruction was provided 30-40 minutes per day, five days a week; with the 5th week devoted to review the learned words in previous weeks. Students were to learn 10-12 target words each week for 15 weeks. Each week, ELLs were provided the text in both English and Spanish to review on Monday. On Tuesday, whole group lessons were presented to include the English text as well as the target words. Students were then asked to complete the required assignment to identify the target words using the text context as clues. On Wednesday, students were assigned to heterogeneous groups to complete cloze passages with the target words learned. Then, on Thursday, activities including word association and semantic feature analysis were provided to reinforce word knowledge. On Friday, the activities were varied including analysis of root words, cognate awareness, and word analysis strategies to enhance vocabulary learning.

Students were assessed using both the Peabody Picture Vocabulary Test and specific vocabulary tests to evaluate their understanding of the target words in a variety of ways including word recognition, mastery of word meanings, word association tasks, and morphology activities. Results showed that the instruction improved the performance of both ELLs and EOs in vocabulary learning. Participating students learned the target words explicitly taught and their reading comprehension scores increased with strong gains in word knowledge. It was clear that the students in the intervention group showed a greater gain than those in the control group. It was also found that the

instructional strategies such as teaching vocabulary in context, previously used for EOs, were also successful for ELLs.

Similar findings were presented in Lesaux, et, al's study (2010). However, this study differed slightly due to the fact that it excluded recent immigrants with extremely low levels of English proficiency from the participation. The purpose of this study was to investigate the impact of an academic language program on the vocabulary and reading comprehension of both ELLs (referred to in the study as language minority learners) and their native English speaking peers enrolled in urban middle schools. Participants included 346 ELLs and 130 native English speakers attending seven middle schools, 53% female and 47% male with a median age of 11. They were assigned to treatment and control groups within each of the seven participating schools for 12 weeks. Both pre and post-tests were administered to all participants as well as researcher-created assessments.

The study was designed to increase word knowledge by providing multiple exposures to the words in a variety of forms and in different meaningful contexts. The intervention consisted of a text-based academic language program, referred to as Academic Language Instruction for All Students (ALIAS), and implemented for 12 weeks and consisted of eight-day lesson cycles (45 min per day) and two-week review units. Informational texts used during the intervention were all selected from *Time-For-Kids* magazine. For each cycle, eight or nine target vocabulary words were selected that appeared within the text as well as on the Academic Word List, an empirically based compilation of commonly used academic and cross curricular words. Additional criteria for target word selection included readability at a 4^{th}-6^{th} grade instructional level, length, potential for student engagement, and opportunities for teaching academic vocabulary

within the context. Each eight-day cycle included whole and small group lecturing and independent activities designed to promote opportunities for speaking, reading, listening, and writing the target words. In-class activities included but were not limited to using text context clues. Brainstorming word meanings, crossword puzzle to increase exposures, morphology practice activities, and answering questions in writing were provided as a means to increase student's understanding of target words.

The results showed that students in the intervention groups increased scores on target word mastery, morphological decomposition, and word-meanings-in-context as well as reading comprehension. It seems that the multi-faceted text-based approach to teaching vocabulary within the text context is successful for all students, and using text context is a valuable strategy because it is not only useful for English speakers but also for ELLs.

Visual/Multisensory Approach

In addition to teaching vocabulary within the text context, the visual/multisensory approach has shown to be effective for ELLs (Silverman, 2007; Townsend & Collins, 2009;). In Silverman's study (2007), 72 children; 44% female and 56% male, from five kindergarten classes were chosen to participate in a multi-dimensional vocabulary program (MVP) including the visual/multisensory approach. The five classes we divided into four groups, three were mainstreaming; meaning that the language needs of ELLs were not addressed and the other was immersion with only ELLs and all instruction was provided in English. Lastly, one was a Spanish-English bilingual class where Eos and ELLs were both enrolled. The instruction was provided in English 50% of the day and Spanish 50% of the day. The study was conducted over 14 weeks and an intervention

was implemented three days per week in 30-45 minute sessions with daily lessons of 10-15 words per selected book.

The instruction included introduction of vocabulary within the context of children's literature, definitions and examples of target vocabulary, prompts and questions to promote critical thinking, practice on target word repetition as reinforcement, and examples of words used in multiple contexts. In addition, a variety of visual aides were used to illustrate the meanings of the target words in authentic contexts.

A pre-test and post-test at the beginning and at the end of the study, as well as a follow up test after 6 weeks of the study were provided. Although ELLs were identified as having lower general vocabulary knowledge at the start of the study, their word knowledge grew at a rate that was faster than their English speaking peers (average of 19>14 words). It was found that ELLs were able to acquire the target vocabulary at an elevated rate, however, there was no significant difference between ELLs and EOs' vocabulary knowledge of target words at the conclusion of the study. The results showed that using a visual/ multisensory approach as part of multi-dimensional instruction successfully increased vocabulary development of ELLs.

Similar finding were presented in Townsend and Collin's study (2009), but focused on middle school students in an afterschool program rather than those in a traditional classroom setting. Thirty-seven students, 17 males and 20 females, participated in the study and were assigned to two groups, 20 in the first as the experiment and 17 in the second as the control. The mean age of all participants enrolled in English language development classes was 12. The English proficiency status ranged from the beginning to the early advanced.

All students attended 20 sessions with each lasting 75 minutes. Three-four target words were presented during each session using large informational cards. Each card included the word, its definition, a sentence excluding the target word, and a supportive picture. Sixty words selected from Cox's Academic Word List as well as a variety of Tier two words were presented during the study. Students were assigned to complete a matching game where they were asked to find peers with related cards, draw a picture, write a sentence, or create a skit to demonstrate the word. The other students in the class were then given the assignment of guessing the group's word. Highly interested reading passages were read and additional games were introduced including modified versions of Taboo and Pictionary as a way to reinforce the target words introduced during the instruction.

Participating student's knowledge of target words was assessed following intervention sessions. They were tested individually three times throughout the study using a variety of vocabulary assessments including The Vocabulary Knowledge Scale, The Vocabulary Levels Test and The Peabody Picture Test. In addition, parallel versions of the Measure of Academic Vocabulary were used to measure receptive academic vocabulary knowledge.

Results indicated that a student's level of English proficiency at the start of the study was directly related to the level of vocabulary growth during the study. Ultimately, participants with more advanced English vocabularies experienced more growth than their less advanced peers. In addition, all participants experienced more vocabulary growth as a result of learning in intervention sessions comparing to those participating in alternative activities such as an after school homework club and a reading fluency

intervention program. It appears that when the intervention including visual and multisensory teaching strategies was properly implemented, middle school ELLs became successful in learning English vocabulary. Although some limitations were identified such as small sample size due to the voluntary nature of the study, and a lack of normed assessments available, both studies demonstrated the effectiveness of visual/ multisensory approaches to ELLs in learning vocabulary.

Using Cognates

Teaching English vocabulary to ELLs using cognates is a beneficial way to increase English vocabulary (e.g. Malabonga, Kenyon, Carlo & Louguit, 2008; Proctor & Mo, 2009; Kelley & Kohnert, 2012). Malabinga et al's study (2008) focused on the development and validation of the Cognate Awareness Test (CAT) as a way to measure cognate awareness in Spanish-speaking ELLs. A number of research samples were documented. For example, a pilot study together with two additional studies was conducted within this research to prove the effectiveness of the CAT and compare its results to student performance on the Picture Vocabulary subtest of the Woodcock Language Proficiency Battery Revised (WLPB-R/PV). The CAT was developed to determine if possessing knowledge of high frequency words in Spanish would help ELLs with high cognitive awareness understand the meaning of high frequency English words. It was designed to include 50% of words with Spanish cognates and 50% without Spanish cognates. A pilot study was conducted in addition to two trials during the formal study. At the completion of the study, modifications were made for two subsequent studies over a two-year time span.

In Study 1, participants included 173, 4th grade Spanish-speaking ELLs. Of those, 132 spoke Spanish at home, 37 spoke English at home, and the language spoken within the home of 4 participants was unknown. When in school, 75 of the participants were instructed in Spanish, 85 in English, and it was unknown what language 13 of the participants were instructed.

The CAT was individually administered to all participants and consisted of 52 items; 22 cognates, 22 non-cognates, and 8 less challenging items. In addition, the WLPB-R/PV was administered to measure their English and Spanish vocabulary knowledge. Participants were asked to name the object or action shown in the picture. This test is unique because it is one of very few assessments that have versions available in both English and Spanish.

Results show that there is a connection between high Spanish vocabulary knowledge (demonstrated by the WLPB-R/PV) and high vocabulary scores on cognate test items on the CAT. This, however, was not the case for participants that demonstrated high English vocabulary knowledge. In addition, high English vocabulary knowledge on the WLPB-R/PV was a good predictor of high vocabulary scores on the non-cognate items of the CAT. This showed that the use of cognates was an effective way to teach English vocabulary to Spanish-speaking students that possess a high Spanish vocabulary.

Study 2 was conducted during the subsequent year. In this study, participants from the first study were tested again as 5th graders. Due to the varied availability of the participants, only 155 of the original students participated in the second study. Of those, 111 spoke Spanish at home, 33 spoke English at home, and the language spoken at home of 11 participants was unknown. In addition, when in school, 62 of the participants were

instructed in Spanish, 82 in English, and the language for the rest of the participants was unknown. The instructional procedures mirrored those in Study 1, and the results were extremely similar. Based on the results of this study, the CAT was found to be a useful measure of cognate knowledge in ELLs. In addition, it shows that cognates can be helpful to increase English vocabulary of ELLs.

Further, Proctor and Mo's study (2009) supported the effectiveness of using cognates to teach vocabulary to ELLs using the CAT. A total of 30, 4th graders were selected to participate in the four-week study to promote vocabulary knowledge as well as reading comprehension. Of those, 16 were bilingual and 14 were EOs identified as struggling with reading, 11 males and 19 females. Researchers were interested in determining if Spanish-speaking bilinguals performed as well as or better than EOs on a reading vocabulary test that incorporated a high percentage of Spanish-English cognates. They were also interested in learning if there was a relationship between cognate knowledge and English reading comprehension. The CAT was administered in a whole group setting and followed by an intervention. During the intervention, students read four internet-based narrative texts and four internet-based informational texts. Before each text, students completed internet-based activities that highlighted five target words with Spanish-English cognates. When being assessed at the conclusion of the intervention, it was determined that EOs performed significantly higher on reading comprehension than the bilingual students. However, it was also found that bilingual status was a strong predictor of cognate awareness, which indicated that when cognates were present, bilingual students significantly outperformed their EO peers.

Kelley and Kohnert's study (2012) reinforced these findings. Their study examined if Spanish-English ELLs are more likely to identify the meanings of cognates versus non-cognates by identifying the variables associated with student performance on English receptive and expressive vocabulary. Participants included 30 ELLs ranging in an age from 7-13 who primarily spoke Spanish at home with 4 to 8 years of exposure to the English language. These students were assessed by two standardized tests including the Peabody Picture Vocabulary Test (3rd edition) to measure English receptive vocabulary, and the English Expressive One-Word Picture Vocabulary Test to assess expressive English vocabulary. Results showed that as a group, students correctly answered significantly more cognate questions compared to the non-cognates. This may imply that students were able to use the cognates presented to help increase their understanding of English vocabulary. When analyzing the results of individual students, however, only 60% had a higher average for cognates than non-cognates. The results of the individual test were similar, showing that individual participants had higher scores on cognate questions than the non-cognate. This indicated that cognates support ELLs' acquisition of English vocabulary.

Technology-Based Instruction

In addition to traditional teaching strategies, technology-based instruction including the verbal/auditory approach, specifically designed software, and online graphic organizers have been found effective in teaching vocabulary to ELLs (Schwartzman, 2004; Palmer, Chai-I, Chang & Leclere, 2006; Silverman & Hines, 2009; Campbell & Rivas, 2012; Leacox & Wood Jackson, 2014). Technology based-

instruction refers to instruction delivered using technology such as computers, iPads, and mobile devices.

Verbal/Auditory Approach

In Silverman and Hines' study (2009), multi-media enhanced read aloud vocabulary intervention was compared to the read aloud without multimedia enhancements. Eighty-five students were selected to participate in this study including 15 pre-kindergarteners, 28 kindergarteners, 25, 1st graders, and 17, 2nd graders. Of these, 68% were non-ELLs and 32% were ELLs.

Two intervention conditions were established for this study: non-multimedia and multimedia. Intervention for both conditions included scripted instruction, three times per week for 12 weeks. The content taught in both conditions was the same (i.e., Rainforests), however, the delivery of instruction varied at times due to only one group receiving multimedia infused instruction. Assessments were conducted using researcher designed measures (Target Vocabulary Assessment) as well as the Peabody Vocabulary Test (3rd Edition) to collect the baseline information regarding student's knowledge of target words. The same tests were conducted at the conclusion of the intervention. Results were analyzed and compared using student's language backgrounds. It was found that the use of multimedia during the intervention had no effect on non-ELLs, however, ELLs scored significantly higher on post-tests when multimedia-enhanced instruction was provided. In addition, it was found that after receiving multimedia-enhanced instruction, there was no longer a difference in knowledge of target words between ELLs and non-ELLs. Limitations found within this study included limited duration and number of classroom participation.

Leacox and Wood Jackson's study (2014) supported the effectiveness of technology-based instruction to teach English vocabulary to ELLs, however, their findings were not as clear as the previous study by Silverman and Hines (2009). This study was designed to examine the effects of ELL's vocabulary acquisition during the adult-read and technology-enhanced repeated reading. Participants included 24, pre-schoolers and kindergarteners with 8 males and 16 females from migrant families. All children were ELLs with an average age from 4-6 years.

A pre-test was administered prior to the intervention using the Peabody Vocabulary Test (4^{th} edition) and the Test de Vocabulario en Imagenes Peabody to measure receptive vocabulary. During the intervention, two groups of children participated in repeated reading activities three times per week with a focus on four target words each week. In the control group, the three day sequence included identical lessons where children listened to the story read aloud by a trained research assistant. The treatment group's intervention followed a different sequence. On Day 1, a four word vocabulary preview was provided with verbal repetition followed by students' listening to the story read aloud. On Days 2 and 3, technology-enhanced English reading with Spanish bridging e-book was read using a computer. Each of the four vocabulary words appeared three times for 12 total exposures of Spanish bridging.

At the end, the post-tests were provided to compare student's performance. Results showed that significant gains were obtained by the students participating in technology-enhanced activities. It appears that technology-based instruction using a visual/auditory approach is a successful way to increase vocabulary knowledge for ELLs.

Software

In Palmer et al's study (2006), software was utilized as part of a multifaceted intervention to increase vocabulary and literacy development for ELLs. Two male 2nd graders were selected to participate in this study. Both students were Chinese native speakers (Mandarin) in the process of learning English. *Rosetta Stone*, a technology based software used to aid in language acquisition was provided to both students. This software combines audio, video, text, and images to immerse ELLs in the English language. Students were actively engaged in *Rosetta Stone* sessions. In addition to the software, students participated in additional literacy activities including Cognitive Academic Language Proficient Training, which provides repeated English vocabulary exposure, journal writing, and teacher-lead direct vocabulary instruction. In addition, their native language of Mandarin was often used to provide examples as a way to help students make connections to the newly introduced English vocabulary. Finally, researchers examined the distinct learning styles and school expectations of the students. All interventions were provided with these learning styles in mind. When all components were put into place, both boys experienced vocabulary gains. It appears that the use of software such as *Rosetta Stone* is successful in increasing vocabulary knowledge for ELLs when used as a component of a multi-dimensional literacy program.

Empirical Data has examined the impact of using additional software programs to enhance vocabulary instruction for ELLs from kindergarten-high school including *Compass Learning Odyssey ELL Elementary* and *First English* (Schwartzman, 2004).

Compass Learning Odyssey ELL Elementary is software focused on increasing functional and social vocabulary for K-6 ELLs. Colorful animated graphics are used to

engage students as they complete vocabulary, writing, listening, and recording activities games. For example, students are provided authentic situations, and asked to complete the missing information. Students must scroll their computer mouse over the desired word choice and it's read aloud. Once students select the correct answer, the program provides positive reinforcement followed by the next question.

Another software available for teaching vocabulary to ELLs is *First Student*. When using this program, students complete structured lessons that include listening, dialogue, vocabulary, and grammar, as well as number and letter recognition. All lessons are cross-curricular to enhance student's vocabulary understanding. In addition to providing instruction in a manner that is viewed as enjoyable, ELLs are also exposed to interactive situations such as friendly conversations including who-what-when-where-why-how questions, mock phone calls and weather discussions to assist their learning as they adjust to a new culture by providing background knowledge.

Online Graphic Organizers

Empirical Data has examined the use of online graphic organizers to enhance vocabulary instruction for ELLs (Campbell & Rivas, 2012). Graphic organizers are visual representations of the material that a student is currently learning. Due to ELL's common lack of background knowledge, graphic organizers increase opportunities for them to work through challenging vocabulary using visual representation. For example, the website *www.read-think-write.com* is an interactive online graphic organizer generator that can be used to support students as they learn challenging vocabulary, concepts, or information. Often students prefer online graphic organizers to traditional pencil and paper versions because it is easier for them to correct errors on the electronic

version. Online graphic organizers are an effective way to provide ELLs with visual representation to enhance English vocabulary acquisition.

Summary

The above research, though limited, has demonstrated the effectiveness of a variety of instructional strategies used to teach vocabulary for ELLs. In addition to traditional strategies that include teaching vocabulary within the text context (Carlo, August, McLaughlin, Snow, Dressler, Lippman, Lively, & White, 2004; Lesaux, Kieffer Faller &Kelley, 2010), using the visual/multisensory approach (Silverman, 2007; Townsend & Collins, 2009;), and the use of cognates to increase English language acquisition (Malabonga, Kenyon, Carlo & Louguit, 2008; Proctor & Mo, 2009; Kelley & Kohnert, 2012), technology-based vocabulary instruction including the verbal/auditory approach (Silverman & Hines, 2009; Leacox & Wood Jackson, 2014), specifically designed software (Schwartzman, 2004; Palmer, Chai-I, Chang & Leclere, 2006) and online graphic organizers **(**Campbell & Rivas, 2012**)** were found to be an effective way to increase vocabulary knowledge of ELLs. Although studies examining the effects of vocabulary instruction on ELLs were so limited, no examples of contradicting results were identified. Based on the review, it seems that technology-based instruction has potential in vocabulary teaching for ELLs, but limited data has been collected to evaluate its effects. There is a need to expand research in this area to include mobile devices such as iPads in vocabulary instruction.

Chapter 3

Method

Contexts of the Study

Setting. The study was conducted at an elementary school in Southern New Jersey. The school built in 1926, with a student population of 392 ranging from pre-kindergarten through 8th grade, is located in an urban school district. During the school year of 2014-2015, 30 students qualified for ELL services. Of these, 24 speaking Spanish, 1 speaking Chinese, 2 speaking Vietnamese, and 3 speaking Myanmar. These students were instructed mainly in their inclusive general education classroom by the general education teacher and the ELL teacher as well as occasional small group instruction in the ELL classroom. This study was conducted in a 3rd grade classroom. There are 20 students in the class, 16 of which are general education students and four with disabilities. There is one full time general education teacher in the classroom for all of the whole class instruction. A special education teacher is present for small group instruction, 80 minutes per day. During this study, only the special education teacher provided instruction for this small group of students.

Participants

Students. Five, 3rd graders enrolled in the school's ELL program participated in this study. They received small group support in the inclusive setting as well as pull out support in the ELL classroom for 30 minutes of language arts with a special education teacher each day. All students speak primarily Spanish in their homes and their parents/guardian speak limited English. Table 1 presents the general information about the participating students.

Table 1

General Information About Participating Students

Student	Age	Gender	Native Country	*Fountas and Pinnell Guided Reading Level (Heinemann, 2015)	Number of Years Enrolled in ELL Program
1	9.1	F	Mexico	H (Grade One)	3.5
2	8.10	F	Mexico	K (Grade Two)	2.5
3	9.1	F	Puerto Rico	H (Grade One)	2.5
4	8.8	M	Mexico	G (Grade One)	3.5
5	8.8	M	Puerto Rico	A (kindergarten)	>1

*Note: *A:* a Kindergarten reading level; *H/G:* 1st grade reading level; *K:* 2nd grade reading level

Student 1 is a 9 year old Hispanic girl who speaks Spanish as her primary language at home. She has been receiving ELL services for three and a half years, but currently still has difficulty expressing herself in English. She speaks with broken words, consistently makes plural words singular, and uses incorrect verb tenses. She lacks decoding skills and struggles to use the words correctly in her causal conversation. This student has a positive attitude toward difficult tasks.

Student 2 is an 8 year old Hispanic girl. She has been enrolled in ELL services since entering this school two and a half years ago. She often misuses English vocabulary with limited conversational skills. She gets confused easily and needs extended processing time when given oral directions. She often stares at the teacher looking for guidance and gets frustrated easily. On occasion, when she is unable to produce the desired English vocabulary, she interjects Spanish words into her English sentences. She tries hard to complete assignments in class.

Student 3 is a 9 year old Hispanic female. Her native language is Spanish and she has been receiving ELL services for two and a half years. After substantial ELL instruction, she continues to have difficulty conveying her intended message in English and often reverts to Spanish out of frustration.

Student 4 is an 8 year old Hispanic male. He has been participating in ELL classes for three and a half years. He often answers questions with one or two words to avoid building a conversation. In writing, he does not provide details or explanations to support his answer due to a lack of vocabulary. In addition, he has a great sense of humor and likes to makes his classmates laugh. He is able to complete all tasks assigned but the quality is poor, especially when English vocabulary is required even after being enrolled in the ELL class for such an extended duration.

Student 5 is an 8 year old Hispanic male. He has been enrolled in ELL classes since his arrival in the United States four months ago. He has had no previous exposure to the English language. His English is extremely limited which caused his struggling to participate in class activities. Although it is a challenge, he shows perseverance and does not want to give up even when frustrated.

Teacher. One Special Education teacher participated in the study. The teacher has seven years of teaching experience in vocabulary instruction for struggling students including those with disabilities and ELLs. All vocabulary instruction and assessments were delivered by this teacher 30 minutes a day, 3 times a week for 8 weeks. Student assessment scores were reviewed for accuracy by a teacher's assistant together with the teacher.

Materials

Instructional materials.

Vocabulary list. A total of 36 vocabulary words were selected from the 3rd grade Dolch sight words. These words were selected by the teacher based on their common conversational function in the English Language and readability level (see a sample list of 3rd grade vocabulary words in Appendix A). Five words were removed from the originally published list due to the abstract and challenging nature of the word meanings. Words were taught using flash cards that included the word as well as the definition (see a sample in Appendix C) and visual examples using images found on google images (see a sample in Appendix E).

IPad application. An iPads was used to access the application, *Learning Touch Sight Words Pro* (see a sample screen in Appendix F). This application presents vocabulary words on the list selected by the teacher. An instructor can decide whether the name of the letter or the letter sound be orally presented to the learner after a correct letter choice has been made. It includes auditory, visual and kinesthetic approaches for each word presented. For example, an individual word is always presented together with a visual image. Thus, when the learner touches the icon of the correct letter, the target word is accurately assembled, then an auditory sound, followed by a visual representation of the word meaning will automatically scroll across the screen. This auditory sound and movement motivate learners to continue the process in learning another word for practice.

Measurement materials.

Flashcards. 36 Flashcards (see a sample in Appendix C) were used to assess student's ability to recognize the target words as well as provide the word's meaning. The word appeared on one side of the card while the word's meaning was shown on the back. Five seconds was provided to view each flashcard before an oral answer was presented.

Cloze sentences. Cloze sentences (see a sample in Appendix D) were developed to assess students' understanding of the target word by selecting the appropriate word from a choice of two words to correctly complete the sentence. The responses were oral with 1 minute waiting time.

Survey. Survey with 4 questions (see a sample in Appendix G) in a format of "yes" or "no" was developed by the teacher to evaluate their satisfaction with the iPad application in learning vocabulary words at the end of the 8th week.

Procedures

Instructional procedures. At the start of each two-week block of Phase B, one of the four lists (9 words per list-see Appendix B for individual word lists) was introduced. Words were taught by presenting each word individually to the students using flashcards (see a sample in Appendix C). Spelling, pronunciation, meaning, examples of application, and visual representation were provided by the teacher and each word was discussed to ensure each individual student understood. Table 2 provides instructional procedures.

Table 2

Instructional Procedures

Week	Instructional Procedure
1	The teacher introduced list 1 of 4 words to the students using flashcards. Words were read aloud, their meanings, pronunciation and application examples were provided, and a visual representation of each word was given. The teacher then instructed students how to navigate through the iPad application and complete the desired objectives. Students practiced using the application with teacher supervision to ensure understanding. Students then practiced the nine words using the iPad application independently for three 30 minute sessions during week one.
2	The teacher reviewed/reinforced list 1 following the same procedure as that in week 1. Students then practiced the nine words using the iPad application independently for three 30 minute sessions during week 2.
3	The teacher introduced list 2 of 4 words to the students using flashcards. Words were read aloud, their meanings, pronunciation and application examples were provided, and a visual representation of each word was given. Students then practiced the nine words using the iPad application independently for three 30 minute sessions during week 3.
4	The teacher reviewed/reinforced list 2 following the same procedure as used in week 3. Students then practiced the nine words using the iPad application independently for three 30 minute sessions during week 4.
5	The teacher introduced list 3 of 4 words to the students using flashcards. Words were read aloud, their meanings, pronunciation and application examples were provided, and a visual representation of each word was given. Students then practiced the nine words using the iPad application independently for three 30 minute sessions during week 5.
6	The teacher reviewed/reinforced list 3 following the same procedure as used in week 5. Students then practiced the nine words using the iPad application independently for three 30 minute sessions during week 6.
7	The teacher introduced list 4 of 4 words to the students using flashcards. Words were read aloud, their meanings, pronunciation and application examples were provided, and a visual representation of each word was given. Students then practiced the nine words using the iPad application independently for three 30 minute sessions during week 7.
8	Teacher reviewed/reinforced list 4 following the same procedure as used in week 7. Students then practiced these nine words using the iPad application for three 30 minute sessions during week 8.

IPad application. Students were taught how to use the iPad to correctly access and navigate the Learning Touch Sight Words Pro application. During each of three 30 minute sessions per week, each word from the teacher selected list was read aloud. The student was given a set of blank boxes and prompted to drag floating letters into the correct position, to complete the missing word (see Figure 1). As the correct letters are dragged and dropped into the position, the letter name or letter sound was automatically real aloud. If an incorrect letter choice was made, the letter was returned to the letter choice box and no oral representation was presented. Once the word was correctly assembled, the word was read aloud and the Mispeak© animated icon; which was specifically created by linguists and speech pathologists to effectively represent the word meaning, with an image scrolled across the screen.

h	O	t

Figure 1. Word Box Sample

Measurement procedures.

Flash cards. Students were individually assessed using flash cards (see a sample in Appendix C) to orally respond to teacher's questions about each of the 36 words on the list. Each flashcard was shown to the individual student to sound out the word. Next, each flashcard was again shown to prompt the student to tell the word meaning. Students were given a five second wait time to provide oral answers. If a correct answer was not provided within five seconds it was considered incorrect. No partial credit was given for

any answers. Correct answers included responses that were pronounced correctly and included a complete definition of the word as it was taught during the instruction.

Cloze sentences. Students were read a cloze sentence and given two possible answers for choices. They were given a five second wait time to provide oral responses with the answer choice they believed to correctly complete the sentence. If a correct answer was not provided within five seconds it was considered incorrect. No partial credit was given for any answers. Correct answers included responses that were pronounced correctly and included the appropriate word to complete the sentence as it was taught during the instruction.

At the end of each week, students were tested on the 9 words that were learned during the week regarding sounding out each word, the meaning using flash cards, and completing a cloze sentence with the word. The same procedures were conducted in each phase. Two weeks of intervention were devoted to each target word list (total of four lists/eight weeks). At the end of each two-week time span, the teacher updated the word list within the technology-based iPad application to include the next set of vocabulary words. During Phase C, all 36 words were assessed using the flash cards and cloze sentences to evaluate student performance in learning vocabulary words.

Survey. At the conclusion of the study, participant's opinion about the iPad application was evaluated using a survey (see Appendix G). Each survey question was read to each student individually, and they were required to answer with "yes" or "no". The teacher recorded each student's responses respectively.

Research Design

A multiple-baseline, single subject design was used for this study with A B C phases. During Phase A, the baseline, each participant was tested in three areas of vocabulary learning including word recognition, meaning, and application for five sessions using flashcards and cloze sentences for the 36 words. Their scores were recorded. During Phase B, the intervention, participants were taught 36 sight words and practiced using the iPad application of *Learning Touch Sight Words Pro* for 30 minute sessions three times a week for eight weeks. The same assessments were provided to each participant each week. After one week of instruction concluded, students were assessed again to evaluate their maintenance of the vocabulary learning in Phase C without an iPad for all 36 words. The data included one week of baseline, eight weeks of intervention, and one week of maintenance.

Data Analysis

A visual graph was created to display data of all three phases as well as means and standard deviations in a table to compare student scores. The survey responses were presented in percentages to reflect learner's satisfaction with the iPad application in the vocabulary learning.

Chapter 4

Results

Participating student's performance in baseline, intervention, and maintenance were analyzed to determine whether student's learning growth was experienced in the areas of word recognition, understanding of word meanings, and word application. Descriptive data for each of these dependent variables are presented in Table 3.

Table 3

Means and Standard Deviations of Vocabulary Scores by Percentages Across Phases

Student	Word Recognition		Word Meaning		Word Application	
	M	SD	M	SD	M	SD
S1						
Baseline	22	3	0	0	0	0
Intervention	71	12	23	11	53	18
	(P1-72, P2-52, P3-66, P4-66)		(P1-33, P2-39, P3-17, P4-17)		(P1-39, P2-67, P3-56, P4-50)	
Maintenance	73	1	31	1	69	2
S2						
Baseline	50	6	9	1	21	2
Intervention	79	17	37	15	79	21
	(P1-89, P2-95, P3-66, P4-66)		(P1-39, P2-525, P3-34, P4-28)		(P1-67, P2-78 P3-50, P4-100)	
Maintenance	86	28	38	5	90	3
S3						
Baseline	36	0	0	0	32	3
Intervention	73	14	37	17	63	12
	(P1-83, P2-73, P3-67, P4-67)		(P1-50, P2-55, P3-23, P4-39)		(P1-67, P2-61, P3-62, P4-66)	
Maintenance	82	6	45	4	77	3
S4						
Baseline	33	2	1	2	17	1
Intervention	71	14	35	15	58	17
	(P1-73, P2-73, P3-67, P4-73)		(P1-33, P2-61, P3-33, P4-28)		(P1-61, P2-61, P3-45, P4-67)	
Maintenance	87	2	44	1	77	2
S5						
Baseline	17	2	0	0	0	0
Intervention	74	21	35	15	75	16
	(P1-78, P2-73, P3-84, P4-61)		(P1-44, P2-44, P3-39, P4-28)		(P1-84, P2-73, P3-73, P4-73)	
Maintenance	93	2	43	4	86	6

* P1 = Probe 1, P2 = Probe 2, P3 = Probe 3, P4 = Probe 4

Table 3 shows the mean scores of each student in baseline, intervention, and maintenance. Baseline data of all five students confirmed a strong need to increase

English vocabulary recognition, word meaning and application, because the importance of vocabulary acquisition is a critical component in determining academic success in school aged children (Foil & Alber, 2002). During the baseline, students were assessed 3-5 times on all 36 target words. During the intervention, each student was each assessed using four probes (nine words per probe) for two consecutive weeks. Finally, during the maintenance, each was assessed five times on all 36 target words again to evaluate their performance.

Intervention results demonstrated that five students mean scores increased from 29-57% for word recognition, 23-37% for word meaning, and 31-75% for word application, comparing to those in the baseline. During the maintenance, all five students retained their growth obtained during the intervention. In general, data indicates that the using the iPad to teach English vocabulary words increased word recognition, word meaning, and word application for these students. Figure 2 shows each student's performance during baseline, intervention, and maintenance.

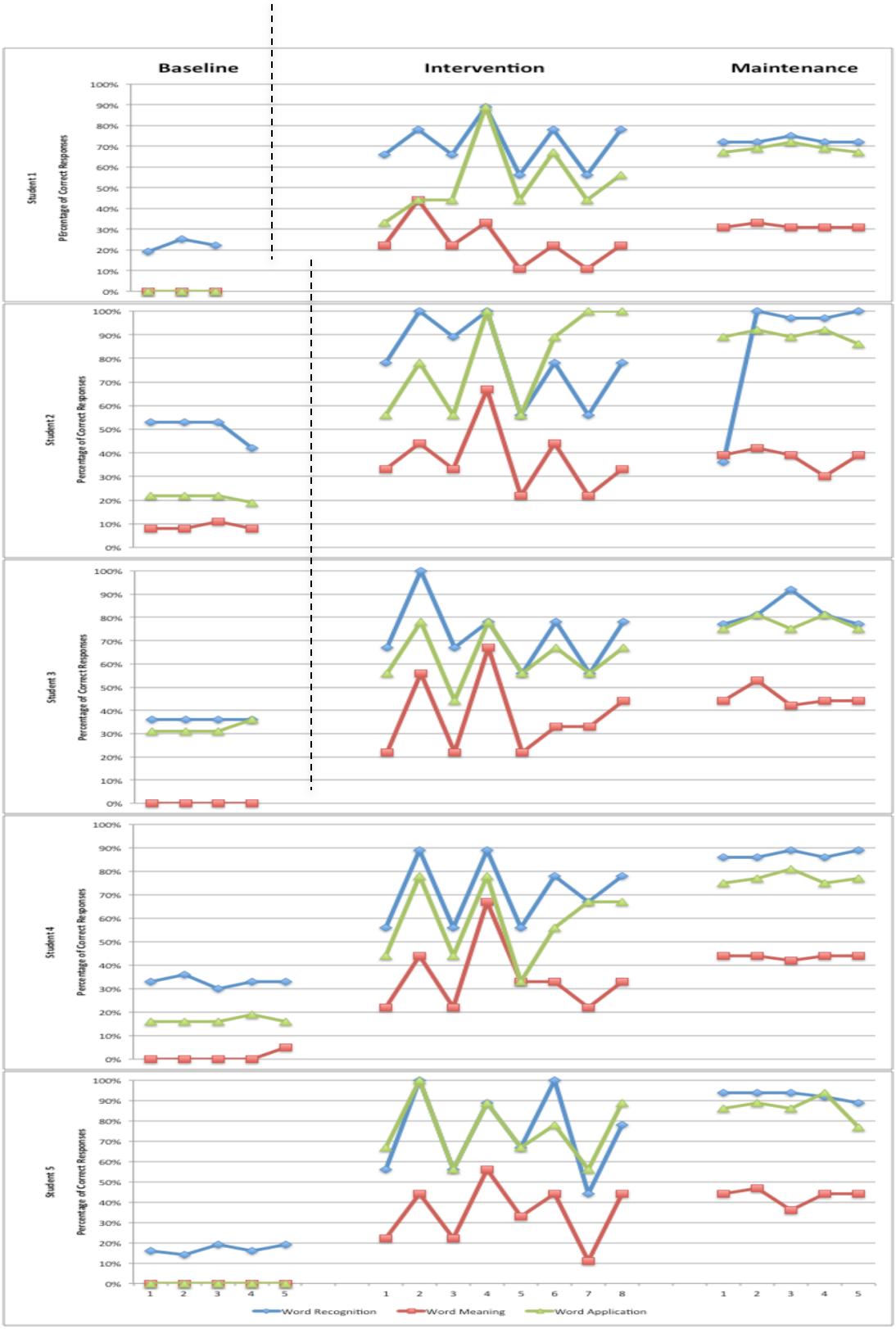

Figure 2. Student's performance in the areas of word recognition, word meaning, and application

At the end of the maintenance, students were given a survey including four questions in "yes" or "no" format. When asked if they liked using the iPads to learn new English vocabulary, all students (100%) responded positively. When asked if they preferred learning new English vocabulary words using the iPad more than other ways that they have been taught in the past, all students (100%) responded favorably. When asked if they believed that the iPad helped them learn more new English vocabulary words than they would have if they were taught in other ways, all students (100%) agreed. Lastly, when asked if they would like to use the iPad again to learn additional vocabulary words all students (100%) were in favor. All students enjoyed using the iPad in learning words and a high level of engagement was observed in class activities. Table 4 shows the survey results.

Table 4

Survey Results

Survey Question	**Responses**
Did you like using the iPad to learn new English vocabulary words?	100% of students responded "yes"
Did you like using the iPad to learn new vocabulary more than the other ways that you have been taught in the past?	100% of students responded "yes"
Do you think you learned more new words using the iPad then you would have if taught another way?	100% of students responded "yes"
Would you like to use the iPad again to learn more vocabulary words?	100% of students responded "yes"

Chapter 5

Discussion

This study examined the impact of technology-based instruction using an iPad to enhance vocabulary teaching by evaluating ELL's learning outcomes. It was hypothesized that as a result of the intervention, student's scores in the areas of word recognition, meaning, and application would increase.

Results show that all five students' scores increased from 29 to 57% in word recognition. For example, student 1's mean score of 22% during the baseline has increased to 71% during the intervention. Student 2 increased to 79% comparing to 50% during the baseline, student 3 from 36% to 73%, student 4 from 33% to 71%, and student 5 from 17% to 74%.

Results also exhibited that all of the students improved their scores of understanding word meaning. An increase of 23 to 27% in mean scores was observed during the intervention. For example, student 1's mean score was 0% during the baseline and earned 23% during the intervention. Student 2 increased from 9% during the baseline to 37% during the intervention, student 3 from 0% to 37%, student 4 from 1% to 35%, and student 5 from 0% to 35%. Although all students gained scores in the area of word meaning, it is the smallest increase of the three areas.

Finally, results clearly indicated that all five students increased their scores of word application. The scores for word application were improved from 31 to 75%. For example, student 1's mean score was 0% during the baseline and earned 53% during the intervention. Student 2 increased from 21% during the baseline to 79% during the intervention, student 3 from 32% to 63%, student 4 from 17% to 58%, and student 5 from

0% to 75%. Comparatively, word application was the largest growth among the three areas. After 2 weeks of the intervention, students were assessed with all 36 words in three areas to evaluate their retention. Surprisingly, student's scores in all three areas increased, despite the discontinuation of intervention for two weeks. It is my belief that this is a result of generalization, due to the target words being common for 3rd graders.

When comparing these results with the study by Leacox and Wood Jackson (2014), similar findings were obtained. Although both studies included ELL participants, in their study a control group comprised of non-ELLs was included. In the current study, only ELLs participated to compare their learning outcomes.

In their study, participants listened to repeated readings in English and Spanish using e-books presented by a computer. Four English vocabulary words were reinforced three times each in each session. Two technology-based sessions took place each week. Post-tests were conducted following intervention to evaluate their learning outcomes through a picture representing the target word (English receptive knowledge), providing a label for each illustrated target word (English naming), and providing word meanings for each word in English and Spanish (bilingual definitions). Results showed that participating students gained scores when technology-based repeated reading was provided.

The present study assessed student's vocabulary learning in three areas including word recognition, word meaning and word application. During the intervention, participants learned 36 English words using the iPad application called *Learning Touch Sight Words Pro*. They were required to drag floating letters into the correct position to complete the missing word. As the correct letter was dragged and dropped into the

position, the letter name or letter sound was automatically read aloud. If an incorrect letter was selected, the letter would return to the letter choice box and no oral representation was presented. Once the word was correctly assembled, the word was read aloud and an animated icon would present. This visual presentation provides learners an opportunity to review letters, words, and practice the spelling. Such a hands-on activity may reinforce learners' motivation in practicing of the vocabulary words, as a result, their vocabulary scores in all three areas increased**.**

Distinct differences between the two studies were identified. The study by Leacox and Wood Jackson (2014) used e-books accessed by a computer, while the present study used an iPad application. In addition, the research design was different in both studies. Their study used a control and experimental group design, in which participants in the control group were compared to those in the treatment group. The present study used a single subject design to examine individual student's learning outcomes over a period of time.

Limitations

Despite the positive outcomes of the study, a number of limitations have been noted. The first was the sample size of five students. Due to the nature of the study, potential participants were limited to students enrolled in the English Language Learner program. Increased student participation may be needed to validate the findings.

A second limitation was the language of the participants. Spanish was the native language of all participating students in the study. They responded well to the intervention and their vocabulary scores increased in all tested areas. Due to the unique students enrolled in my class, I was unable to include students who speak other native

languages in the study. It is unclear if this intervention would have been successful for those speaking different native languages.

Regional limitation was another concern. All students were in the same class. Although students were not originally from the same area, they are all currently residing in the same town and attending the same school. A fourth and final limitation evident in this study was the lack of normed assessment. The assessment materials were teacher created. Although the results were positive and all participants' vocabulary scores increased, it may not be possible to compare the results to others in other regional areas.

Implications

All participating students experienced an increase in learning vocabulary words using an iPad. However, the iPads used during this study were generously supplied by Rowan University and it was required that they be returned at the conclusion of the study. Without the necessary technology devices, this successful intervention cannot be implemented. In order for the large population of ELL students enrolled at this school to take advantage of learning new vocabulary using technology, it is critical that school administration supply the necessary resources.

In addition, teachers of ELLs must be willing to use technology in their classrooms. With the support of classroom teachers, the use of iPads to increase student's skills in English vocabulary recognition, understanding of meaning, and application would be possible. Finally, in order to engage students and support their personal learning styles, teachers must listen to their opinions about how they prefer to learn. Based on the survey conducted at the end of the study, it was found that ELLs favor using the iPad to learn English vocabulary words over other teaching tools.

Conclusion and Recommendations

Further studies are needed to validate the finding as well as some changes to make the study more effective. For example, the sample size may expand to include ELL students with native languages other than Spanish**.** It might be valuable to examine the effects of using an iPad when teaching vocabulary to non-ELLs too. Based on the increase in vocabulary scores experienced by all five participants, I would continue to implement this intervention and expand the target vocabulary words to meet individual student's goals. Considering the increase in scores among all participants, I believe that using the iPad in vocabulary instruction is a successful tool for ELLs. Teachers and school administrators should consider the potential of using iPads to improve vocabulary instruction, and provide support to ELLs.

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Appendix A

Third Grade Dolch Word List

1. better
2. bring
3. carry
4. clean
5. cut
6. done
7. draw
8. drink
9. eight
10. fall
11. far
12. full
13. got
14. grow
15. hold
16. hot
17. hurt
18. keep
19. kind
20. laugh
21. light
22. long
23. myself
24. only
25. own
26. pick
27. seven
28. show
29. six
30. small
31. start
32. ten
33. today
34. together
35. try
36. warm

*Words omitted from original third grade dolce list: *if, about, shall, never, much*
They were omitted due to the abstract and challenging nature of the word meanings.

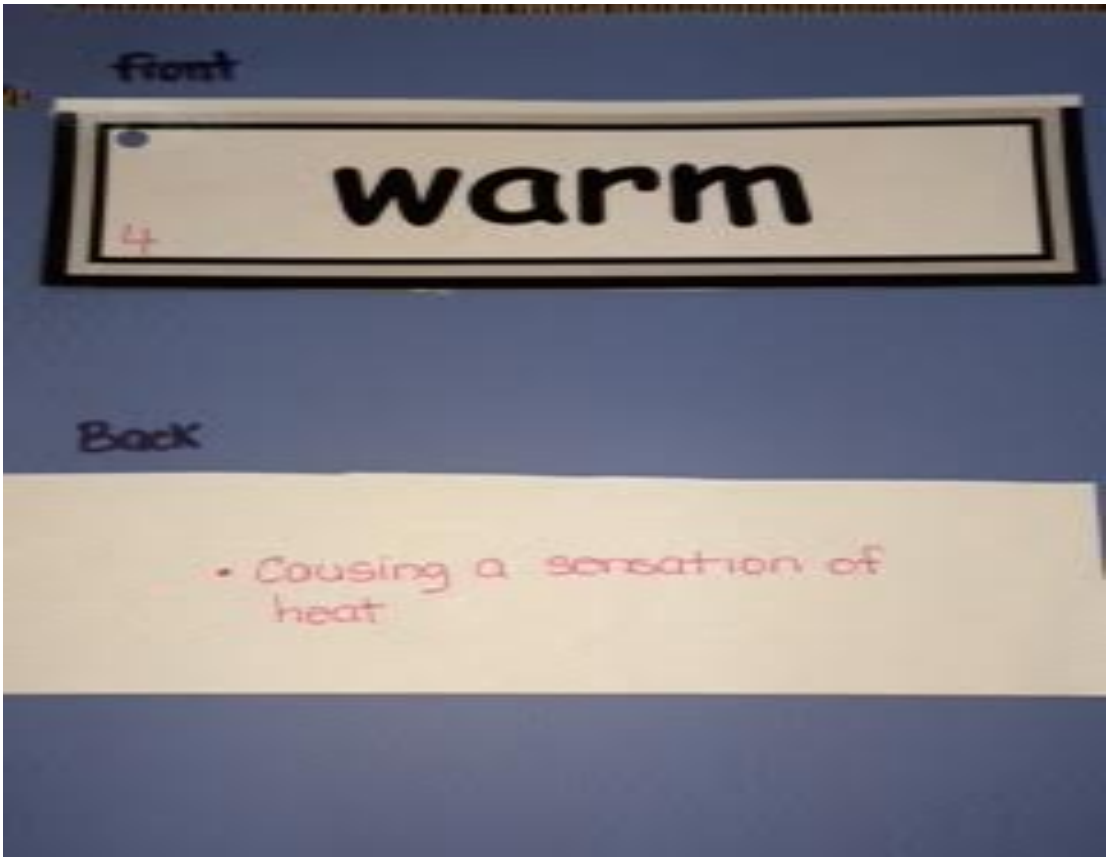
Appendix B

Word Lists (probes) 1-4

List (probe) 1	List (probe) 2	List (prob) 3	List (probe) 4
grow	clean	draw	together
own	hurt	laugh	far
better	show	start	myself
hold	cut	drink	dry
pick	keep	light	full
bring	six	ten	warm
hot	done	eight	got
seven	kind	long	only
carry	small	today	fall

Appendix C

Sample Flash Card



Appendix D

Sample Cloze Sentences

1. I planted a flower seed and I am going to watch it _____.
   (own, **grow**)

2. I used to share a bike with my sister but now I have my _____.
   (kind, **own**)

3. "Do you feel _____ since you took your medicine?" my mom asked.
   (**better**, hold)

4. I had to _____ a heavy bag for my dad because his hands were full.
   (six, **hold**)

5. I wanted to _____ the prettiest flower in the garden to give to my teacher.
   (**pick**, hot)

6. I wanted to _____ my dog to school but the principal said it was not allowed.
   (hold, **bring**)

7. I wear shorts in the Summer because it is very _____.
   (grow, **hot**)

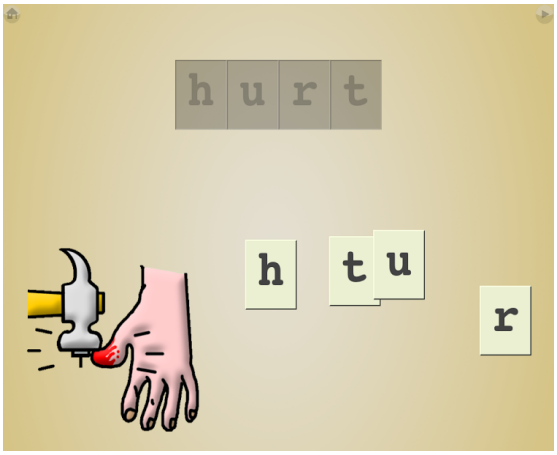
8. I had eight cookies but gave one to Sarah so I had _____cookies left.
   (**seven**, own)

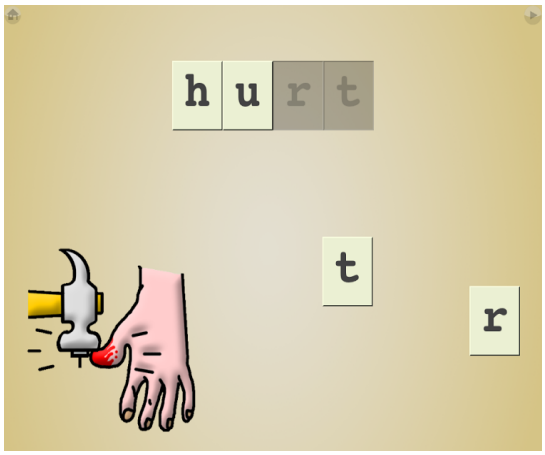
Appendix E

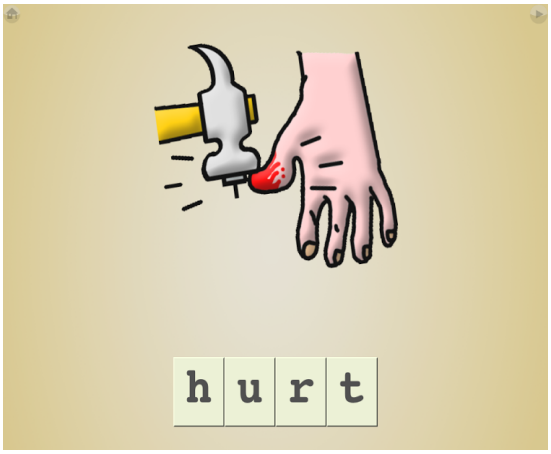
Sample Visual Representation of Target Vocabulary

Appendix F

iPad Application Screen Shot







Appendix G

Sample Survey

1. Did you like using the iPads to learn new English vocabulary? Yes/No

2. Did you prefer learning new English vocabulary words using the iPad more than other ways that they have been taught in the past? Yes/No

3. Do you think that the iPad helped you learn more new English vocabulary words than you would have if you were taught in a different way? Yes/No

4. Would you like to use the iPad again to learn more vocabulary words? Yes/No